

Remarks

The present invention pertains to the use of a composition comprising essential oils as a pesticide primarily for plants, but also as a preservative for food. The application also encompasses a composition for use as a pesticide on plants. The present preparation is especially useful when made with relative high concentrations of essential oils. Previously, such higher essential oil concentrations were not achievable without phytotoxicity. Indeed even 1% essential oil suspension in olive oil will kill many plant species. However, the inventors have discovered a method of forming an emulsion of sufficiently small oil particle size that phytotoxicity is minimized while plant protection is increased substantially.

As an initial matter, this application is subject to a requirement for restriction and election of species. The action states that applicant must elect one species of essential oils. The action also appears to require the selection of one invention from among groups I through V. If one invention must be selected, applicants hereby elect to prosecute the invention of group I and corresponding claims 5-40, 42, 44-50, 70-86, 89-91, 93, 96-99 and 114 and new Claims 117-121, drawn to compositions comprising essential oils and method of applying the composition to plants classified in class 514, subclass 357. Regarding the election of species, applicant hereby elects Carvacrol.

Applicants also respond herein to some of the concerns raised in the action of September 4, 2001. Some of the concerns were addressed in the earlier amendment, but many are addressed by further amendments made hereby. The remarks made herein apply both to those changes made in the amendment of January 17, 2002 and those made hereby. As a preliminary matter, applicants note with appreciation the allowance of Claims 70-86. Naturally, those claims are not amended hereby. However, most of the remaining independent claims have been amended to indicate that the composition is an oil-in-water (aqueous) emulsion, and that the concentration of the essential oil in the emulsion is between 1 and 1000 ppm. Applicants believe that, with these limitations, the claims clearly distinguish over the prior art of record, as explained below.

Claims 1-6, 24-32, 36, 37, 40, 46, 49, 50, 62, 66, and 67 have been rejected under 35 U.S.C. §102(b) as anticipated by JP06065016; 3/8/94 (JP'016). JP'016 shows the application of essential oils of thyme and *laurus nobilis* to stimulate the growth of roots of lawn grass. The Office Action states that it would be inherent in JP'016 that a composition applied to roots would also be delivered into the soil and that its application to soil would control pest growth in the soil, as well as on the roots.

Claims 1-4 were canceled in the response of January 17, 2002 and are reintroduced here in rewritten form as Claims 118-121. Claims 5 and 24 were also amended in response to the rejection of the claimed composition of the present invention. All of these claims have been amended to include the limitation that the composition is an oil-in-water emulsion. It is necessary to emulsify the essential oils and apply at a rate

of from 1-1000 ppm. Non-emulsified compositions, or higher concentrations present phytotoxicity problems in most plants and can kill the plants if the concentration of essential oils is too high. This is especially true where the composition is to be applied to the leaves of the plant. Applicants also suggest that these amendments overcome any prior art of record. As a preliminary matter, it is Applicants' contention that a method of treating roots of grasses with a composition does not inherently mean that the composition would be delivered into soil surrounding the roots of a plant. In the present case, the Japanese experiments were carried out under laboratory conditions where seeds of turfgrass were sown onto two sheets of filter paper in a petri dish. After adding distilled water containing 5 ppm of thymus vulgaris or laurus nobilis oil, seeds were incubated in a growth chamber in the presence of oils, and root length was measured. In these experiments root-promotion effects were evaluated by the relative value of the average root length to that of a control where results indicated 1.5 times increased growth with application of either of these oils at 5 ppm concentrations.

Thus essential oils were applied directly to the roots grown from seeds where the roots were in an artificial environment. Consequently there was no soil. Furthermore, the application of the composition of the present invention is not so much for control of pest growth in the soil as it is the stimulation of favorable bacteria. In the case of the Japanese invention, there would have been no beneficial bacterium in the sterile water-containing petri dishes. But regardless of the details of the experiments underlying

JP'016, JP'016 makes no mention of soil, and no mention of the presence of, stimulation of, or control of bacteria or any pest or pathogen.

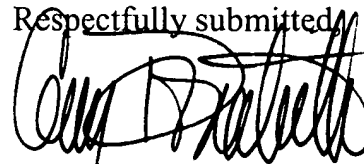
Furthermore, though the concentration of 5 ppm is set forth in the abstract, adding together the amounts of the various components of the composition yields a different concentration. JP '016 uses 75 parts thyme oil, 3 parts polyoxyethylene alkylaryl ether, 2 parts Ca ligninsulfonate and 320 parts water, for a total of 75 pts oil in 400 parts total, or 187,500 ppm, well outside the claimed range of 1-1000 ppm. Furthermore, the composition of JP '016 is not an emulsion, or required by the present claims.

Claims 87, 89, 91-93 have been rejected under 35 U.S.C. §102(b) as being anticipated by Fedin, et al (SU1685319; 10/23/91). This rejection is respectfully traversed. Claim 87 includes three elements, which are applied to seeds to protect them from pathogenic or parasitic organisms. Those three elements are an essential oil, a bacterium which degrades essential oils or their components, and one material that induces systemic resistance in plants. Fedin shows only the treatment of seeds with a composition comprising cymene. Further, Fedin does not use an emulsion. Accordingly, Fedin is missing at least two elements required by Claim 87 and accordingly does not anticipate that Claim.

Claims 9, 12, 13, 15-19, 21, 42, and 44-46 have been rejected under 35 U.S.C. §103(a) as being unpatentable over JP'016. With the amendments to the Claims set forth

above, Applicants believe that these rejections have been met and respectfully request that they be withdrawn.

Accordingly, based upon the amendments and remarks made herewith, Applicants believe that the present invention is in condition for allowance and respectfully request early and favorable notification to that effect.

Respectfully submitted,

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In the Claims

Version with Markings to Show Changes to Claims:

5. (Thrice Amended) ~~A~~ The composition of Claim 118 wherein said ~~to kill or repel~~
~~insects, consisting essentially of one or more essential oils~~ oil ~~or components~~
component thereof comprises at least one compound selected from the group
consisting of *cis*-anethole, *trans*-anethole, anisaldehyde, anisole, camphene,
camphor, carvone, carvacrol, cinnamic aldehyde, citronellal, cineol, 1,8-cineole, *p*-
cymene-8-ol, decanal, geranial, geraniol, geranyl acetate, isoborneol, lavanduol,
limonene, linalool, linalyl acetate, menthol, menthone, methyl chavicol,
methyleugenol, methylinone, nonanal, α -pinene, β -pinene, β -phelladrene, α -
phelladrene, pulegone, terpenyl acetate, α -terpinene, γ -terpinene, terpinene-4-ol,
thymil acetate and thymol.
6. (Previously Amended) The composition of Claim 5, wherein said essential oil or
component thereof is at least one compound selected from the group consisting of
carvacrol, cymene and anethole.
7. The composition of Claim 6 wherein said component is anethole.
8. The composition of Claim 7 wherein said component is *trans*-anethole.
9. ~~The composition of Claim 1 wherein said essential oil or component thereof is~~
~~present in an amount of at least about 1 ppm.~~

10. (Twice Amended) The composition of Claim 118 further including a carrier component for soil application.
11. (Amended) The composition of Claim 8-10 wherein said carrier component is vermiculite or perlite.
12. (Amended) The composition of Claim ~~1~~119 in a liquid form.
13. ~~The composition of Claim 12 wherein said active ingredient is emulsified in water.~~
14. (Amended) The composition of Claim 118 wherein said active ingredient is present in a paint.
15. (Amended) The composition of Claim 118 formulated for vaporization.
16. (Amended) The composition of Claim 118 formulated as an aerosol.
17. (Amended) The composition of Claim 118 formulated as a cream.
18. ~~The composition of Claim 1 formulated as a powder.~~
19. ~~The composition of Claim 1 formulated as a dilution in a carrier oil.~~
20. (Amended) The composition of Claim 118 formulated with paraffin.
21. ~~The composition of Claim 1 wherein said essential oil is present in an amount of about 0.5 to 90%.~~

22. (Twice Amended) The composition of Claim 118 further comprising an emulsifying agent.
23. (Previously Amended) The composition of Claim 22 wherein said emulsifying agent is Tween 20.
24. (Twice Amended) A method of protecting a plant against pathogenic or parasitic organisms comprising applying to at least one of the foliage and rhizosphere of said plant, a composition comprising an oil-in-water emulsion comprising, in the oil phase, as an active ingredient, an essential oil or at least one component thereof in an amount of from 1 to 1000 ppm of the emulsion in an amount sufficient to prevent adverse effects to the plant caused by said pathogenic organisms.
25. (Amended) The method of Claim ~~24~~117 wherein said pathogenic or parasitic organisms are at least one organism selected from the group consisting of nematodes, bacteria, fungi and insects.
26. The method of Claim 25 wherein said insects are selected from the group consisting of mites, ants, aphids, and termites.
27. The method of Claim 26 wherein said insects are at least one species selected from the group consisting of *Tetranychus*.
28. The method of Claim 27 wherein said insects are *Tetranychus cinnabarinus*.

29. (Amended) The method of Claim 24-117 wherein said bacteria are at least one species selected from the group consisting of *Erwinia*, *Xanthomonas*, *Pseudomonas*, *Clavibacter*, and *Agrobacterium*.
30. The method of Claim 29 wherein said bacteria are at least one species selected from the group consisting of *Agrobacterium tumifaciens*, *Clavibacter michiganensis*, *Erwinia amylovora*, *Erwinia carotovora*, *Pseudomonas syringae*, and *Xanthomonas axonopodis*.
31. The method of Claim 30 wherein said fungi are at least one species selected from the group consisting of *Fusarium*, *Rhizoctonia*, *Sclerotinia*, and *Phytophthora*.
32. The method of Claim 31 wherein said fungi are at least one species selected from the group consisting of *Fusarium moniliforme*, *Rhizoctonia solani*, *Sclerotinia sclerotium*, *Phytophthora capsici* and *Phytophthora fragaria*.
33. (Amended) The method of Claim 24-117 wherein said essential oil or component thereof is derived from at least one essential oil producing plant species of a genera selected from the group consisting of *Thymbra*, *Satureja*, *Origanum*, *Corydothymus*, *Pinpinella* and *Foeniculum*.
34. (Amended) The method of Claim 24-117 wherein said essential oil producing plant species is selected from the group consisting of *Thymbra spicata* var. *spicata*, *Satureja thymbra*, *Origanum majorana*, *Corydothymus capitatus*, *Origanum vulgare*, *Origanum solymicum*, *Origanum spyleum*, *Origanum bilgeri*,

Origanum minutiflorum, *Organum saccatum*, *Origanum sriacum*, *Origanum onites*, *Origanum majorana*, *Pinpinella anisum*, and *Foeniculum vulgare*.

35. (Amended) The method of Claim 24-117 wherein said essential oil producing plant species is selected from the group consisting of *Thymbra spicata* var. *spicata* (L) Line Ant97- 364-48, *Satureja thymbra* (L) Line Ant98-28-103, *Pinpinella anisum* (L) Line Ant98-223-137, and *Foeniculum vulgare* (L) Line Ant98-89-62.
36. (Amended) The method of Claim 24-117 wherein said essential oil or component thereof comprises at least one compound selected from the group consisting of *cis*-anethole, *trans*-anethole, anisaldehyde, anis ketone, anisole, β -bisabolene, borneol, bornyl acetate, cadinene, camphene, camphor, Δ -3-carene, Δ -4-carene, carophyllene, carvone, carvacrol, γ -caryophyllene, cinnamic aldehyde, citronellal, cineol, 1,8-cineole, *p*-cymene, *p*-cymene-8-ol, decanal, estragole, eugenol, eugenyl acetate, α -fenchene, fenchole, fenchone, geranial, geraniol, geranyl acetate, isoborneol, lavanduol, limonene, linalool, linalyl acetate, menthol, menthone, menthyl acetate, *cis*-*p*-menth-2-en-1-ol, *trans*-*p*-menth-2-en-1-ol, methoxy phenyl acetone, methyl chavicol, methyleugenol, methylinone, 2-methylpentan-3-one, myrcene, nerol, nonanal, *cis*- β -ocimene, *trans*- β -ocimene, octanal, 3-octanol, α -pinene, β -pinene, β -phelladrene, α -phelladrene, pulegone, sabinene, *cis*-sabinene hydrate, *trans*-sabinene hydrate, γ -terminene, terpenyl acetate, α -terpinene, γ -terpinene, terpinene-4-ol, α -terpineol, β -terpineol,

terpinolene, 2,3,5,6-tetramethylphenol, α -thujene, thymil acetate, thymol, and tricyclene.

37. (Amended) The method of Claim 24-117 wherein said essential oil or component thereof is at least one compound selected from the group consisting of carvacrol, thymol, cymene and anethole.
38. (Amended) The method of Claim 24-117 wherein said component is anethole.
39. (Amended) The method of Claim 24-117 wherein said component is *trans*-anethole.
40. ~~The method of Claim 24 wherein said essential oil or component thereof is present in an amount of at least about 1 ppm.~~
41. (Previously Amended) A method of protecting plants from pathogens comprising inoculating the soil surrounding said plants with a bacterium which degrades essential oils or components thereof.
42. (Amended) The method of claim 24-117 wherein said composition is applied by spraying.
43. The method of Claim 42 further comprising solarization.
44. (Amended) The method of Claim 24-117 wherein said composition is applied by fogging.

45. (Amended) The method of Claim 24-117 wherein said composition is applied in irrigation water.
46. (Amended) The method of Claim 24-117 wherein said composition further comprises a carrier, and said composition is applied in the soil around the plant.
47. The method of Claim 46 wherein said carrier is selected from the group consisting of perlite, commercially available dust preparations, commercially available granule preparations and vermiculite.
48. (Amended) The method of Claim 11724 wherein said composition further comprises paint~~paint~~bacteria which degrades essential oils or components thereof.
49. A fungicide composition comprising an oil-in-water emulsion comprising, in the oil phase, an essential oil, or at least one component thereof from *Laurus nobilis* in an amount of from 1 to 1000 ppm of the emulsion.
50. (Amended) A method of inhibiting fungal infections of plants comprising applying a composition comprising an oil-in-water emulsion comprising, in the oil phase, an essential oil or at least one active component thereof in an amount of from 1 to 1000 ppm of the emulsion to the plant, wherein said essential oil or active component thereof is from *Laurus nobilis*.
51. (Previously Amended) A method of preserving food for storage by repelling or killing insects comprising applying to one of said food and a container containing

- said food a composition comprising, as an active ingredient, an essential oil or a component thereof, wherein said essential oil or component thereof is derived from at least one plant species in the Family *Labiatae* and *Umbellifera*.
52. The method of Claim 51 wherein said plant species is at least one species of a genera selected from the group consisting of *Thymbra*, *Satureja*, *Origanum*, *Corydanthus*, *Pinpinella* and *Foeniculum*.
53. The method of Claim 51 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata*, *Satureja thymbra*, *Origanum majorana*, *Corydanthus capitatus*, *Origanum vulgare*, *Origanum solymicum*, *Origanum spyleum*, *Origanum bilgeri*, *Origanum minutiflorum*, *Origanum saccatum*, *Origanum sriacum*, *Origanum onites*, *Origanum majorana*, *Pinpinella anisum*, and *Foeniculum vulgare*.
54. The method of Claim 51 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata* (L) Line Ant97- 364-48, *Satureja thymbra* (L) Line Ant98-28-103, *Pinpinella anisum* (L) Line Ant98-223-137, and *Foeniculum vulgare* (L) Line Ant98-89-62.
55. The method of Claim 51 wherein said essential oil or component thereof comprises at least one compound selected from the group consisting of *cis*-anethole, *trans*-anethole, anisaldehyde, anis ketone, anisole, β -bisabolene, borneol, bornyl acetate, cadinene, camphene, camphor, Δ -3-carene, Δ -4-carene,

carophyllene, carvone, carvacrol, γ -caryophyllene, cinnamic aldehyde, citronellal, cineol, 1,8-cineole, p -cymene, p -cymene-8-ol, decanal, estragole, eugenol, eugenyl acetate, α -fenchene, fenchole, fenchone, geranial, geraniol, geranyl acetate, isoborneol, lavanduol, limonene, linalool, linalyl acetate, menthol, menthone, menthyl acetate, *cis*- p -menth-2-en-1-ol, *trans*- p -menth-2-en-1-ol, methoxy phenyl acetone, methyl chavicol, methyleugenol, methylinone, 2-methylpentan-3-one, myrcene, nerol, nonanal, *cis*- β -ocimene, *trans*- β -ocimene, octanal, 3-octanol, α -pinene, β -pinene, β -phelladrene, α -phelladrene, pulegone, sabinene, *cis*-sabinene hydrate, *trans*-sabinene hydrate, γ -terminene, terpenyl acetate, α -terpinene, γ -terpinene, terpinene-4-ol, α -terpineol, β -terpineol, terpinolene, 2,3,5,6-tetramethylphenol, α -thujene, thymil acetate, thymol, and tricyclene.

56. The method of Claim 51, wherein said essential oil or component thereof is at least one compound selected from the group consisting of carvacrol, thymol, cymene and anethole.
57. The method of Claim 51 wherein said component is anethole.
58. The method of Claim 51 wherein said component is *trans*-anethole.
59. (Previously Amended) The method of Claim 51 wherein said composition further comprises paraffin and said composition is applied to said food.

60. The method of Claim 51 wherein said insects are at least one species of the genera selected from the group consisting of *Tribolium*, *Sitophilus*, *Ephestia* and *Ceratitus*.
61. The method of Claim 51 wherein said insects are selected from the group consisting of *Tribolium confusum*, *Sitophilus zeamais*, *Sitophilus oryzae*, *Ephestia kuehniella* and *Ceratitus capita*.
62. (Amended) A method of treating pepper root rot disease caused by *Phytophthora capsici* in an affected plant comprising administering an aqueous-oil-in-water emulsion comprising, as an active ingredient, an essential oil or at least one component thereof in an amount of from 1 to 1000 ppm of said emulsion, to the soil about said affected plant.
63. The method of Claim 62 wherein said essential oil is derived from a plant of the Family selected from the group consisting of *Labiatae* and *Umbelliferae*.
64. The method of Claim 62 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata*, *Satureja thymbra*, *Origanum majorana*, *Corydothymus capitatus*, *Origanum vulgare*, *Origanum solymicum*, *Origanum spyleum*, *Origanum bilgeri*, *Origanum minutiflorum*, *Organum saccatum*, *Origanum sriacum*, *Origanum onites*, *Origanum majorana*, *Pinpinella anisum*, and *Foeniculum vulgare*.

65. The method of Claim 62 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata* (L) Line Ant97- 364-48, *Satureja thymbra* (L) Line Ant98-28-103, *Pinpinella anisum* (L) Line Ant98-223-137, and *Foeniculum vulgare* (L) Line Ant98-89-62.
66. The method of Claim 62 wherein said component of said essential oil is at least one compound selected from the group consisting of *cis*-anethole, *trans*-anethole, anisaldehyde, anis ketone, anisole, β -bisabolene, borneol, bornyl acetate, cadinene, camphene, camphor, Δ -3-carene, Δ -4-carene, carophyllene, carvone, carvacrol, γ -caryophyllene, cinnamic aldehyde, citronellal, cineol, 1,8-cineole, *p*-cymene, *p*-cymene-8-ol, decanal, estragole, eugenol, eugenyl acetate, α -fenchene, fenchole, fenchone, geranial, geraniol, geranyl acetate, isoborneol, lavanduol, limonene, linalool, linalyl acetate, menthol, menthone, menthyl acetate, *cis*-*p*-menth-2-en-1-ol, *trans*-*p*-menth-2-en-1-ol, methoxy phenyl acetone, methyl chavicol, methyleugenol, methylinone, 2-methylpentan-3-one, myrcene, nerol, nonanal, *cis*- β -ocimene, *trans*- β -ocimene, octanal, 3-octanol, α -pinene, β -pinene, β -phelladrene, α -phelladrene, pulegone, sabinene, *cis*-sabinene hydrate, *trans*-sabinene hydrate, γ -terminene, terpenyl acetate, α -terpinene, γ -terpinene, terpinene-4-ol, α -terpineol, β -terpineol, terpinolene, 2,3,5,6-tetramethylphenol, α -thujene, thymil acetate, thymol, and tricyclene.
67. The method of Claim 62 wherein said active ingredient is at least one compound selected from the group consisting of carvacrol, thymol, cymene and anethole.

68. The method of Claim 62 wherein said active ingredient is anethole.
69. The method of Claim 62 wherein said active ingredient is *trans*-anethole.
70. (Amended) A method of repelling or killing insects comprising applying a composition to an area, wherein said composition comprises an oil-in-water emulsion comprising, in the oil phase, as an active ingredient, an essential oil or at least one active component thereof in an amount of from 1 to 1000 ppm of the emulsion, said essential oil from at least one plant selected from the genera *Labiata* and *Umbellifera*.
71. The method of Claim 70 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata*, *Satureja thymbra*, *Origanum majorana*, *Corydothymus capitatus*, *Origanum vulgare*, *Origanum solymicum*, *Origanum spyleum*, *Origanum bilgeri*, *Origanum minutiflorum*, *Organum saccatum*, *Origanum sriacum*, *Origanum onites*, *Origanum majorana*, *Pinpinella anisum*, and *Foeniculum vulgare*.
72. The method of Claim 70 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata* (L) Line Ant97- 364-48, *Satureja thymbra* (L) Line Ant98-28-103, *Pinpinella anisum* (L) Line Ant98-223-137, and *Foeniculum vulgare* (L) Line Ant98-89-62.
73. The method of Claim 70 wherein said component of said essential oil is at least one compound selected from the group consisting of *cis*-anethole, *trans*-anethole,

anisaldehyde, anis ketone, anisole, β -bisabolene, borneol, bornyl acetate, cadinene, camphene, camphor, Δ -3-carene, Δ -4-carene, carophyllene, carvone, carvacrol, γ -caryophyllene, cinnamic aldehyde, citronellal, cineol, 1,8-cineole, p -cymene, p -cymene-8-ol, decanal, estragole, eugenol, eugenyl acetate, α -fenchene, fenchole, fenchone, geranial, geraniol, geranyl acetate, isoborneol, lavanduol, limonene, linalool, linalyl acetate, menthol, menthone, menthyl acetate, *cis*- p -menth-2-en-1-ol, *trans*- p -menth-2-en-1-ol, methoxy phenyl acetone, methyl chavicol, methyleugenol, methylinone, 2-methylpentan-3-one, myrcene, nerol, nonanal, *cis*- β -ocimene, *trans*- β -ocimene, octanal, 3-octanol, α -pinene, β -pinene, β -phelladrene, α -phelladrene, pulegone, sabinene, *cis*-sabinene hydrate, *trans*-sabinene hydrate, γ -terminene, terpenyl acetate, α -terpinene, γ -terpinene, terpinene-4-ol, α -terpineol, β -terpineol, terpinolene, 2,3,5,6-tetramethylphenol, α -thujene, thymil acetate, thymol, and tricyclene.

74. The method of Claim 70 wherein said active ingredient is at least one compound selected from the group consisting of carvacrol, thymol, cymene and anethole.
75. The method of Claim 70 wherein said active ingredient is anethole.
76. The method of Claim 70 wherein said active ingredient is *trans*-anethole.
77. ~~The method of Claim 70 wherein said active ingredient is emulsified in water, wherein said composition is formulated as a spray, and wherein said active ingredient is present in a concentration of at least about 1 ppm.~~

78. The method of Claim 70 wherein said active ingredient is combined with at least one inactive oil, wherein said composition is formulated as a fogging vapor, ~~and wherein said essential oil is atomized to a concentration of about 0.25 to 1000 ppm/m² of area.~~
79. The method of Claim 70 wherein said composition further comprises a carrier.
80. The method of Claim 79 wherein said carrier is selected from the group consisting of perlite, commercially available dust preparations, commercially available granule preparations, and vermiculite.
81. The method of Claim 70 wherein said composition is formulated as a cream.
82. The method of Claim 70 wherein said composition is formulated as a powder.
83. The method of Claim 70 wherein said composition is formulated in paraffin.
84. The method of Claim 70 wherein said composition is formulated in paint.
85. The method of Claim 84 wherein said paint is an oil-based paint.
86. The method of Claim 70 wherein said insects are at least one selected from the group consisting of flies, mosquitoes, aphids, fleas, ticks, spiders, cockroaches, ants, termites, and mites.
87. (Previously Amended) A method of protecting plants from pathogenic or parasitic organisms comprising treating seeds of said plants with a composition comprising

at least one essential oil, a bacterium able to degrade said oil or a component thereof and at least one material that induces systemic disease resistance in plants, and thereafter cultivating said seeds.

88. Cancelled.
89. (Amended) The composition of Claim ~~4~~118 further comprising at least one other pesticide.
90. The composition of Claim 49 wherein said composition further comprises at least one other fungicide.
91. The method of Claim 24 wherein said composition further comprises at least one other pesticide.
92. The method of Claim 41 further comprising the application of at least one other pesticide.
93. The method of Claim 50 wherein said composition further comprises at least one other fungicide.
94. The method of Claim 51 wherein said composition further comprises at least one other pesticide.
95. The method of Claim 62 wherein said aqueous emulsion further comprises at least one other pesticide.

96. The method of Claim 70 wherein said composition further comprises at least one other pesticide.
97. The method of Claim 24 wherein said essential oil is in an emulsion in water.
98. The method of Claim 97 wherein said oil is present in an amount of greater than 10 ppm.
99. The method of Claim 97 wherein said oil is present in an amount of greater than 25 ppm.
100. (Amended) A method of protecting a plant against pathogenic or parasitic organisms comprising increasing beneficial soil bacteria surrounding the roots of said plant by applying to the soil around said plant a composition comprising an oil-in-water emulsion comprising, in the oil phase, as an active ingredient, an essential oil or at least one component thereof in an amount of from 1 to 1000 ppm of the emulsion, in an amount sufficient to foster an increase in said beneficial soil bacteria.
101. The method of Claim 100 wherein said essential oil or component thereof is derived from at least one essential oil producing plant species of a genera selected from the group consisting of *Thymbra*, *Satureja*, *Origanum*, *Corydothymus*, *Pinpinella* and *Foeniculum*.

102. The method of Claim 101 wherein said essential oil producing plant species is selected from the group consisting of *Thymbra spicata* var. *spicata*, *Satureja thymbra*, *Origanum majorana*, *Corydothymus capitatus*, *Origanum vulgare*, *Origanum solymicum*, *Origanum spyleum*, *Origanum bilgeri*, *Origanum minutiflorum*, *Origanum saccatum*, *Origanum sriacum*, *Origanum onites*, *Origanum majorana*, *Pinpinella anisum*, and *Foeniculum vulgare*.
103. The method of Claim 102 wherein said essential oil producing plant species is selected from the group consisting of *Thymbra spicata* var. *spicata* (L) Line Ant97- 364-48, *Satureja thymbra* (L) Line Ant98-28-103, *Pinpinella anisum* (L) Line Ant98-223-137, and *Foeniculum vulgare* (L) Line Ant98-89-62.
104. The method of Claim 100 wherein said essential oil or component thereof comprises at least one compound selected from the group consisting of *cis*-anethole, *trans*-anethole, anisaldehyde, anis ketone, anisole, β -bisabolene, borneol, bornyl acetate, cadinene, camphene, camphor, Δ -3-carene, Δ -4-carene, carophyllene, carvone, carvacrol, γ -caryophyllene, cinnamic aldehyde, citronellal, cineol, 1,8-cineole, *p*-cymene, *p*-cymene-8-ol, decanal, estragole, eugenol, eugenyl acetate, α -fenchene, fenchole, fenchone, geranial, geraniol, geranyl acetate, isoborneol, lavanduol, limonene, linalool, linalyl acetate, menthol, menthone, menthyl acetate, *cis*-*p*-menth-2-en-1-ol, *trans*-*p*-menth-2-en-1-ol, methoxy phenyl acetone, methyl chavicol, methyleugenol, methylinone, 2-methylpentan-3-one, myrcene, nerol, nonanal, *cis*- β -ocimene, *trans*- β -ocimene,

octanal, 3-octanol, α -pinene, β -pinene, β -phelladrene, α -phelladrene, pulegone, sabinene, *cis*-sabinene hydrate, *trans*-sabinene hydrate, γ -terminene, terpenyl acetate, α -terpinene, γ -terpinene, terpinene-4-ol, α -terpineol, β -terpineol, terpinolene, 2,3,5,6-tetramethylphenol, α -thujene, thymil acetate, thymol, and tricyclene.

105. The method of Claim 104 wherein said essential oil or component thereof is at least one compound selected from the group consisting of carvacrol, thymol, cymene and anethole.
106. The method of Claim 105 wherein said component is anethole.
107. The method of Claim 100 wherein said essential oil is in an emulsion in water.
108. The method of Claim 107 wherein said oil is present in an amount of greater than 10 ppm.
109. The method of Claim 108 wherein said oil is present in an amount of greater than 25 ppm.
110. The method of Claim 100 wherein said composition further comprises a bacterium able to degrade said oil or at least one component thereof.
111. The method of Claim 110 wherein said bacterium is a *Pseudomonas fluorescens*.

112. The method of Claim 51 wherein applying said composition to said container comprises introducing into said container said composition in the form of vapor or airborne particles.
113. The method of Claim 87 wherein said bacterium is *Pseudomonas fluorescens* TR97.
114. The composition of Claim 22 wherein said emulsifying agent is an oil.
115. The method of Claim 41 further comprising introducing an essential oil to said soil.
116. The method of Claim 115 wherein said essential oil and bacterium are applied by one of:
- fogging;
- incorporation into irrigation water; and
- application to a substrate selected from dust preparations, granule preparations, perlite and vermiculite.

Kindly add the following new claims:

117. (New) The method of Claim 24 wherein said emulsion further comprises a vegetable oil.

118. (New) A composition to repel or kill insects, fungi, nematodes and bacteria, comprising, an oil-in-water emulsion comprising, in the oil phase, as an active ingredient, an essential oil or a component thereof in an amount of from 1 to 1000 ppm of the emulsion, wherein said essential oil or component thereof is derived from at least one plant species in the Family *Labiatae* and *Umbellifera*.
119. (New) The composition of Claim 118 wherein said emulsion further comprises a vegetable oil.
120. (New) The composition of Claim 118 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata*, *Satureja thymbra*, *Origanum majorana*, *Corydothymus capitatus*, *Origanum vulgare*, *Origanum solymicum*, *Origanum spyleum*, *Origanum bilgeri*, *Origanum minutiflorum*, *Organum saccatum*, *Origanum sriacum*, *Origanum onites*, *Origanum majorana*, *Pinpinella anisum*, and *Foeniculum vulgare*.
121. (New) The composition of Claim 120 wherein said plant species is selected from the group consisting of *Thymbra spicata* var. *spicata* (L) Line Ant97- 364-48, *Satureja thymbra* (L) Line Ant98-28-103, *Pinpinella anisum* (L) Line Ant98-223-137, and *Foeniculum vulgare* (L) Line Ant98-89-62.